IN THE CLAIMS:

Please amend the claims as follows:

25. (Currently amended three times) A fluorescence assay, comprising the steps of:

providing a waveguide which is optically conductive and which has at least one surface having a plurality of capture oligonucleotides [site-specifically] immobilized site-specifically to substantially all regions of the at least one surface having a base coating thereon, the base coating being located only on portions of the at least one surface [thereon], wherein the capture oligonucleotides have a binding site which selectively binds a selected analyte;

providing a light source operable to emit a light beam in a desired wavelength range and positioned to send light into the waveguide;

providing a detection element operably disposed to directly collect radiated fluorescence emitted from molecules located adjacent to a surface of the waveguide;

providing a sample comprising a buffer and a plurality of molecules of a selected analyte;

providing a plurality of tracer molecules which are operable to emit fluorescence in response to stimulation by an evanescent field adjacent to a surface of the waveguide;

combining the sample with the tracer molecules to produce a test solution;

placing the test solution in contact with the waveguide surface while operating the light source to direct light into the waveguide to generate the evanescent field; and

selectively and directly collecting radiated fluorescent light emitted from the tracer molecules.

26. (Previously amended) The assay of Claim 25, wherein said step of providing a waveguide with site-specifically immobilized capture oligonucleotides includes the steps of:

coating the waveguide surface with a first coating to produce a coated surface;

providing a plurality of capture oligonucleotides;

modifying a single moiety which is the same on each capture molecule, to produce activated capture oligonucleotides having a modified moiety constructed to be coupled to the first coating; and

treating the coated surface with the activated capture oligonucleotides under conditions to cause the modified moiety to couple to the first coating and thereby immobilize the activated capture oligonucleotides to the waveguide surface.

27. (Previously amended) The assay of Claim 25, wherein said first coating is selected from the group consisting of: avidin, biotin, a hydrogel formed of polymethacryloyl polymers, and a modified polyethylene glycol.

28. (Previously amended) The assay of Claim 25, wherein an oligonucleotide primer acting as a capture oligonucleotide complementary to said analyte is immobilized to said waveguide by amine-reactive, thiol-reactive, or (strep) avidin-biotin coupling chemistry.

29. (Previously amended) The assay of Claim 25, wherein said tracer molecules are complementary to a second sequence of said analyte.